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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SANDERS, KRIELLION ANTIONETTE

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/789,549

Applicant(s)

SCHEER ET AL.

Examiner

Kriellion A. Sanders

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "magnesium and silicate"

3. in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloembergen, et al. US Patent No. 5,462,983 in view of Sinclair, US Patent No. 4,045,418 and Suzuki, et al. 6,136,905

Bloembergen, et al. US Patent No. 5,462,983 discloses a biodegradable moldable product or film product prepared from a compatible blend comprising a biodegradable, hydrophobic, water repellant, amorphous, starch ester having a degree of substitution of about

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1.0 to about 2.5 DS and a biodegradable polyester selected from the class consisting of poly(.epsilon-caprolactone) (PCL), poly(lactic acid) or polylactide (PLA), poly(glycolic acid) or polyglycolide (PGA), bacterial and synthetic poly(.beta.-hydroxybutyrate-co-.beta.-hydroxyvalerate) (PHB/V) and poly(.beta.-hydroxyalkanoates) (PHA).

Patentee further discloses a moldable composition comprising a compatible thermoplastic blend of a biodegradable, predominantly amorphous, hydrophobic, water repellant, starch ester having a degree of substitution (DS) of about 1.0 to about 2.5 DS and a biodegradable polyester is selected from the group consisting of poly(.epsilon.-caprolactone) (PCL), poly(lactic acid) or polylactide (PLA), poly(glycolic acid) or polyglycolide (PGA), bacterial and synthetic poly(.beta.-hydroxybutyrate-co-.beta.-hydroxyvalerate) (PHB/V), poly(.beta.-hydroxyalkanoates) (PHA), and aliphatic biodegradable polyesters.

A plasticizer can be added to the composition to achieve greater material processability and product flexibility. Molded articles and films prepared from the blends of starch esters with polyesters can be enhanced by mixing with a variety of low molecular-weight ester plasticizers of the solvent type. The plasticizers must be biodegradable. Examples of such plasticizers include a variety of esters, such as phthalate esters (dimethyl-, diethyl-, dipropyl-, dibutyl-, dihexyl-, diheptyl-, dioctyl-, etc.), dimethyl- and diethylsuccinate and related esters, glycerol triacetate (triacetin), glycerol mono- and diacetate, glycerol mono-, di and tripropionate, glycerol tributanoate (tributyrin), glycerol mono- and dibutanoate, glycerol mono-, di- and tristearate, and other related glycerol esters, *lactic acid* esters, citric acid esters, *adipic acid* esters, stearic acid esters, oleic acid esters, ricinoleic acid esters, other fatty acid esters, erucic acid esters, soybean

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oil, castor oil, and various other biodegradable esters known in the chemical arts. It is noted that lactic acid and adipic acid are equated for purposes of the invention.

Additionally, inorganic and organic fillers can be added to extend the range of properties of molded articles. Such inorganic fillers include talc (hydrous *magnesium silicate*), titanium dioxide, calcium carbonate, clay, sand, chalk, limestone, diatomaceous earth, silicates, boron nitride, mica, glass, quartz, and ceramics, and biodegradable organic fillers such as starch, cellulose, wood flour and fibers, pecan fibers, and other inorganic and organic filler materials well known in the chemical arts. See col. 5, line 46 through col. 8, line 56.

Sinclair, US Patent No. 4,045,418 discloses copolymers that may be fabricated into films, fibers and structural shapes, and are prepared by copolymerizing an optically inactive lactide, i.e., D, L-lactide, and epsilon caprolactone in the presence of a tin ester of a carboxylic acid, wherein said mixture comprises about 60 to about 90 percent by weight of D, L-lactide and 10-15% by weight of epsilon caprolactone. The copolymers produced in accordance with the present invention depending upon the D, L-lactide/epsilon caprolactone ratio, find utility in the manufacture of films, fibers, moldings and laminates which are prepared by conventional fabricating methods. A filler may be incorporated in the copolymer prior to curing. The filler material functions to modifying various properties of the molding such as hardness, strength, temperature resistance, etc. Suitable conventional filler materials useful for the invention include aluminum powder, powdered calcium carbonate, silica, kaolinite (clay) and *magnesium silicate*. A variety of free-radical agents such as, for example, dibenzoyl peroxide, lauroyl peroxide, t-butyl hydroperoxide, t-butyl perbenzoate and di-t-butyl peroxide may also be used in the invention. The preferred free-radical agent is dibenzoyl peroxide. In general, the amount of free-

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radical agent is within the range of about 0.1 to 10 percent based on the weight of the copolymer. When a free-radical agent is employed, curing may be conducted at a temperature between about 60 degree and about 150 degree C.

The objects formed from the copolymers of the invention are taught to be slowly biodegradable. The patent does not teach inclusion of adipic acid. See col.1, line 5 through col. 7, line 67.

Because Bloembergen, et al. equates the use of adipic acid and lactic acid in forming biodegradable compositions based on caprolactone components, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to utilize a mixture of the two acids with the expectation of achieving an at least additive effect.

Suzuki, et al. US Patent No. 6,136,905 discloses a lactic acid polymer composition comprising 100 parts by weight of a mixture consisting of 80-95% by weight of an *L-lactic acid* polymer having an *L-lactic acid* proportion of 75% or more and 5-20% by weight of a plasticizer selected from the group consisting of a polyhydric alcohol ester and a hydroxypolycarboxylic acid ester. Patentee teaches a molded product and film obtained from the composition and a process of preparing the same. Exemplary hydroxycarboxylic acids that may be used in combination with lactic acids include glycolic acid, 3-hydroxybutyric acid, 4-hydroxybutyric acid, 4-hydroxyvaleric acid, 5-hydroxyvaleric acid, 6-hydroxycaproic acid, and cyclic ester intermediates of the hydroxycarboxylic acids, for example, glycolide which is a dimer of glycolic acid and epsilon.-*caprolactone* which is a cyclic ester of 6-hydroxycaproic acid. Exemplary plasticizers which may be used for the invention include hydroxypolycarboxylic acid

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esters such as acetyl tributyl citrate and polyhydric alcohol esters such as glycerol triacetate and glycerol tripropionate. The proportion of the plasticizer to *L-lactic acid* polymer is 20-5% by weight, preferably 15-9% by weight of the plasticizer for 80-95% by weight of *L-lactic acid* polymer. A film may be obtained by extruding the compositions. A shrink, stretched film having a heat shrinkage of 10-45% at 120.degree. C. and a non-shrink, stretched film having a heat shrinkage of less than 1% are illustrated by patentee. The molded products and films obtained from the composition are said to have excellent transparency, flexibility, anti-blocking properties and slipping properties, and are suitably used for containers of cosmetics, daily necessities and groceries, bottles, sheets, films, laminates and packaging materials. When these articles are disposed as waste and buried under the ground or abandoned into the sea or a river, they can be biodegraded like natural materials such as paper and wood into harmless water and carbon dioxide in the natural environment within a relatively short period. See col. 2, line 50 through col. 5, line 49. The patent does not teach inclusion of a peroxy agent or of magnesium silicate.

The formation of films from lactic acid /caprolactone compositions that are useful in making packaging materials for foods is obvious in view of Suzuki et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kriellion A. Sanders whose telephone number is 571-272-1122. The examiner can normally be reached on Monday through Thursday 6:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kriellion A. Sanders
Primary Examiner
Art Unit 1714

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